

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Withdrawn) A method for preparing a microcapsule comprising the steps of:
 - 1) dissolving a mixture of low-molecular and a high-molecular weight polyols in a polymer solution containing wall-component polymer to make polyol solution;
 - 2) adding the polyol solution into an aqueous solution containing stabilization agent and emulsifying to obtain emulsion;
 - 3) removing solvent from the emulsion while stirring under reduced-pressure condition in a vacuum evaporator to make dispersed solution;
 - 4) filtering the dispersed solution to remove aqueous materials to collect microcapsules;
- and
- 5) drying the collected microcapsules in a vacuum evaporator at room temperature to obtain polyol/polymer microcapsules.
2. (Withdrawn) The method according to claim 1, wherein the amount of the sum of the low molecular weight polyol and high molecular weight polyol is the same with that of the wall-component.
3. (Withdrawn) The method according to claim 1, wherein the stabilizer is at least one selected from the group consisting of arabic, tragacanth, karaya, larch, ghatti, locust bean, guar, agar, alginate, carrageenan, furcellaran, pectin, gelatin, starch and derivatives thereof; dextran, xanthan gum and derivatives thereof; and copolymer containing polyvinyl, polyacryl, polyol and the derivatives thereof.

4. (Withdrawn) The method according to claim 1, wherein the low molecular weight polyol is at least one selected from the group consisting of polyethylene glycol, polypropylene glycol, butylene glycol, propylene glycol, copolymers and derivatives thereof.

5. (Withdrawn) The method according to claim 1, wherein the amount of the low molecular weight polyol is about 0.1 ~ 70wt% of the total weight of the microcapsule.

6. (Withdrawn) The method according to claim 1, wherein the molecular weight of the low molecular weight polyol is less than 1000g/mol and acts as template.

7. (Withdrawn) The method according to claim 1, wherein the high molecular weight polyol is at least one selected from the group consisting of polyethylene glycol, polypropylene glycol, copolymers and derivatives thereof.

8. (Withdrawn) The method according to claim 1, wherein the wall-component polymer is at least one selected from the group consisting of polyester, polyacrylate, polyvinylester, unsaturated carboxylic acid, copolymers and derivatives thereof.

9. (Withdrawn) The method according to claim 1, wherein the amount of the wall-component polymer is 1 ~ 99.99wt% to the total weight of the microcapsule.

10.-11. (Canceled).

12. (Previously Presented) The method according to claim 19, wherein the enzyme is at least one selected from the group consisting of oxidoreductase, transferase, hydrolase, lyase, isomerase, synthase and ligase.

13. (Withdrawn) A microcapsule composed of triple layers comprising:
an internal nuclei with active component;
hydrophobic high molecular weight polyol surrounding the nuclei; and
outer polymer wall.

14. Canceled.

15. Canceled.

16. Canceled.

17. (Withdrawn) A cosmetic composition containing a microcapsule composed of triple layers comprising:

an internal nuclei with active component;

hydrophobic high molecular weight polyol surrounding the nuclei; and

outer polymer wall.

18. (Withdrawn) The cosmetic composition according to claim 17, wherein the active component is at least one selected from the group consisting of retinol, retinyl acetate, retinyl palmitate, tocopherol, tocopheryl acetate, tocopheryl linoleate, tocopheryl nicotinate, linoleic acid, coenzyme Q-10, resveratrol, lipoic acid, licorice, ascorbic acid, and chlorogenic acid.

19. (Currently Amended) A method of preparing triple-layered microcapsules containing an enzyme stabilized therein comprising the steps of:

1) dispersing an enzyme into a low molecular weight polyol selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers or derivatives thereof; butylene glycol, propylene glycol or glycerine, whose molecular weight is 1,000 g/mol or less to disperseform a polyol domain in the microcapsule and stabilize the enzyme;

2) re-dispersing the dispersed enzyme/polyol solution of step 1) into a polymer solution containing high molecular weight polyol selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers or derivatives thereof, whose molecular weight is more than 1,000 g/mol to provide hydrophobic distribution of the enzyme in the microcapsule

which provides a buffer that prevents direct contact between the enzyme and the hydrophobic wall material in the microcapsule;

3) emulsifying the solution of step 2) to collect an emulsion; and
4) solidifying the enzyme/polyol/polymer emulsion of step 2) and separating the aqueous low molecular weight polyol which flows out from an inner phase through an external surface of the microcapsule while the high molecular polyol remains in the microcapsule and collecting hard polymer microcapsules;

wherein a wall-component polymer selected from the group consisting of poly-L-lactic acid, poly-D,L-glycolic acid, poly-L-lactic acid-co-glycolic acid, poly-D,L-lactic acid-co-glycolic acid, polycaprolactone, polyvalerolactone, polyhydroxybutyrate, polyhydroxyvalerate, polyorthoester, and copolymers produced from these monomers, polystyrene, poly p- or m-methylstyrene, poly p- or m-ethylstyrene, poly p- or m-chlorostyrene, poly p- or m-chloromethylstyrene, polystyrene sulfonic acid, poly p-, m- or t-butoxystyrene, polymethyl(meth)acrylate, polyethyl(meth)acrylate, polypropyl(meth)acrylate, poly n-butyl(meth)acrylate, polyisobutyl(meth)acrylate, poly t-butyl(meth)acrylate, poly 2-ethylhexyl(meth)acrylate, poly n-octyl(meth)acrylate, polylauryl (meth)acrylate, polystearyl(meth)acrylate, poly 2-hydroxyethyl(meth)acrylate, polyethylene glycol(meth)acrylate, metoxypolyethylene glycol(meth)acrylate, polyglycidyl(meth)acrylate, polydimethylaminoethyl(meth)acrylate, polydiethylaminoethyl(meth)acrylate, polyvinylpropionate, polyvinylbutyrate, polyvinylether, polyallylbutelether, polyallylglycidylether, poly(meth)acrylic acid, polymaleic acid, polyalkyl(meth)acrylamide and poly(meth)acrylonitrile is dissolved in the polymer solution of step 2),

thereby producing a three component microcapsule in which the enzyme is surrounded and protected by the high molecular weight polyol and the wall component polymer forms an outer wall around the enzyme and high molecular weight polyol.

20. (New) A method of preparing triple-layered microcapsules containing an enzyme stabilized therein comprising the steps of:

1) dispersing an enzyme into a low molecular weight polyol selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers or derivatives thereof; butylene glycol, propylene glycol or glycerine, whose molecular weight is 1,000 g/mol or less to form spherical dispersoids in which only the external layer of the enzyme partially dissolves therein to form an enzyme/polyol mixture phase dispersed solution to disperse, protect and stabilize the enzyme;

2) re-dispersing the dispersed enzyme/polyol solution of step 1) into a polymer solution containing high molecular weight polyol selected from the group consisting of polyethylene glycol, polypropylene glycol, and copolymers or derivatives thereof, whose molecular weight is more than 1,000 g/mol to provide hydrophobic distribution of the enzyme in the microcapsule which provides a buffer that prevents direct contact between the enzyme and the hydrophobic wall material in the microcapsule;

3) emulsifying the solution of step 2) to collect an emulsion; and

4) solidifying the enzyme/polyol/polymer emulsion of step 2) and separating the aqueous low molecular weight polyol which flows out from an inner phase through an external surface of the microcapsule while the high molecular polyol remains in the microcapsule and collecting hard polymer microcapsules;

wherein a wall-component polymer selected from the group consisting of poly-L-lactic acid, poly-D,L-glycolic acid, poly-L-lactic acid-co-glycolic acid, poly-D,L-lactic acid-co-glycolic acid, polycaprolactone, polyvalerolactone, polyhydroxybutyrate, polyhydroxyvalerate, polyorthoester, and copolymers produced from these monomers, polystyrene, poly p- or m-methylstyrene, poly p- or m-ethystyrene, poly p- or m-chlorostyrene, poly p- or m-chloromethylstyrene, polystyrene sulfonic acid, poly p-, m- or t-butoxystyrene, polymethyl(meth)acrylate, polyethyl(meth)acrylate, polypropyl(meth)acrylate, poly n-butyl(meth)acrylate, polyisobutyl(meth)acrylate, poly t-butyl(meth)acrylate, poly 2-ethylhexyl(meth)acrylate, poly n-octyl(meth)acrylate, polylauryl (meth)acrylate, polystearyl(meth)acrylate, poly 2-hydroxyethyl(meth)acrylate, polyethylene glycol(meth)acrylate, polyglycidyl(meth)acrylate, polydimethylaminoethyl(meth)acrylate, polydiethylaminoethyl(meth)acrylate, polyvinylpropionate, polyvinylbutyrate, polyvinylether, polyallylbutelether, polyallylglycidylether, poly(meth)acrylic acid, polymaleic acid, polyalkyl(meth)acrylamide and poly(meth)acrylonitrile is dissolved in the polymer solution of step 2),

thereby producing a three component microcapsule in which the enzyme is surrounded and protected by the high molecular weight polyol and the wall component polymer forms an outer wall around the enzyme and high molecular weight polyol.

21. (New) The method according to claim 20, wherein the enzyme is at least one selected from the group consisting of oxidoreductase, transferase, hydrolase, lyase, isomerase, synthase and ligase.